

REFLECTIVE SIGNAGE

Field of the Invention

The present invention relates to signage and, more particularly, relates to signage having improved visibility.

Background of the Invention

5 Signs and banners are commonly used to identify and display a preference for, and support of, a team or individual in a sports competition, including, among others, football, basketball, baseball, soccer, tennis, rugby, track and field, swimming, or motor vehicle racing. Such signage also is used in connection with other types of entertainment events, such as concerts, as well as at political rallies and other gatherings and social
10 events. Conventional signage typically is constructed of plastic, metal, paper, wood and/or cloth and usually includes a desired "message" permanently printed, adhered or otherwise placed thereon. The message generally comprises a written or other visual representation. For example, the message can include a slogan, a person's name, a team name, or a logo. Although such signage is relatively inexpensive to manufacture, the
15 visibility of such signage can be decreased where there are a number of similar competing signs and/or in environments having reduced lighting, whether due to weather or nightfall. One proposed solution to increase the visibility of conventional signage has been to use relatively intense colors. However, such a solution is not always practical, especially where the desired message is a logo requiring a particular color motif or trade
20 dress.

Accordingly, there is a need for improved signage having high visibility. The signage should be inexpensive to manufacture, allow for the permanent placement of a desired message, be capable of supporting variations in color motifs and be easily recognizable in relatively dim lighting conditions and when used with other competing
25 signs.

Summary of the Invention

The present invention provides a sign having improved visibility for displaying a message. According to one embodiment, the sign comprises at least one support member and a body portion secured to the at least one support member for positioning the body portion at a predetermined elevation. In one embodiment, the support member defines a curved portion for frictionally engaging the body portion. In another embodiment, the support member defines a wire-like member. The body portion can have a variety of configurations. In one embodiment, the body portion has a configuration selected from the group including a circle, an oval, a triangle, a square, a rectangle, a pentagon, a hexagon, a heptagon, an octagon, a nonagon, a decagon, a motor vehicle, a football, a football helmet, a bottle, a numeric character, or an alphabetic character. The body portion can be formed of polypropylene.

The sign includes at least one reflective layer at least partially secured to the body portion. The reflective layer defines a holographic pattern. In one embodiment, the reflective layer comprises a polyester hologram foil. In another embodiment, the reflective layer defines a pattern comprising a plurality of characters, including numeric characters and/or alphabetic characters. In another embodiment, the reflective layer defines a broken-glass pattern. In still another embodiment, the reflective layer defines a box pattern. In yet another embodiment, the reflective layer defines a circular pattern.

In one embodiment, the sign also includes at least one optically transmissive layer at least partially secured to the at least one reflective layer such that the reflective layer is at least partially positioned between the optically transmissive layer and the body portion. The optically transmissive layer can be formed of clear polyester or polypropylene. The optically transmissive layer defines at least one message. In one embodiment, the message comprises at least one graphic design, numeric character, or alphabetic character. According to this embodiment, the reflective layer is structured to reflect light through the optically transmissive layer to thereby visibly display the plurality of holographic characters defined by the reflective layer and to enhance the visibility of the message defined by the optically transmissive layer.

In another embodiment, the optically transmissive layer defines an interior portion, a border encompassing the interior portion, and at least one message positioned

at least partially within the interior portion. The interior portion and the border comprise contrasting colors. According to this embodiment, the reflective layer is structured to reflect light through the optically transmissive layer to augment the contrast between the interior portion and the border defined by the optically transmissive layer to thereby enhance the visibility of the message positioned at least partially within the interior portion.

In yet another embodiment, the message is printed directly onto the at least one reflective layer such that the reflective layer is structured to reflect light about the message to visibly display said plurality of characters and enhance the visibility of said message. In still another embodiment, the reflective layer defines an interior portion, a border encompassing the interior portion, and at least one message positioned at least partially within the interior portion. The interior portion and the border comprise contrasting colors. According to this embodiment, the reflective layer is structured to reflect light so as to augment the contrast between the interior portion and the border defined by the reflective layer to thereby enhance the visibility of the message positioned at least partially within the interior portion.

Accordingly, the present invention provides an improved sign having high visibility. The sign is inexpensive to manufacture, allows for the permanent placement of a desired message, is capable of supporting variations in color motifs and is easily recognizable in relatively dim lighting conditions and when used with other competing signs.

Brief Description of the Drawings

The foregoing and other advantages and features of the invention, and the manner in which the same are accomplished, will become more readily apparent upon consideration of the following detailed description of the invention taken in conjunction with the accompanying drawings, which illustrate preferred and exemplary embodiments, and which are not necessarily drawn to scale, wherein:

Figure 1 is a partially exploded elevation view illustrating the body portion, reflective layer and optically transmissive layer of a sign, according to one embodiment of the present invention;

Figure 2 is a partially exploded elevation view illustrating the body portion, reflective layer and optically transmissive layer of a sign, according to another embodiment of the present invention;

Figures 3A-3Q are elevation views illustrating alternative configurations of the body portion, according to various embodiments of the present invention;

Figure 4 is an elevation view illustrating the curved portion of the support member, according to one embodiment of the present invention;

Figure 5 is a partially exploded elevation view illustrating the body portion and reflective layer of a sign, according to one embodiment of the present invention;

Figure 6 is a partially exploded elevation view illustrating the body portion and reflective layer of a sign, according to another embodiment of the present invention; and

Figures 7A-7E are photocopies of exemplary holographic patterns, according to various embodiments of the invention.

Detailed Description of the Invention

The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout.

Referring to the drawings and, in particular, to Figures 1, 2, 5 and 6 there are illustrated signs **10** having improved visibility for displaying a message **12**, according to two embodiments of the present invention. Each sign **10** includes a body portion **14**. In the illustrated embodiments, the body portion **14** is relatively thin thereby defining two relatively flat, symmetrical surfaces **11**. In other embodiments (not shown), the body portion **14** can have a three dimensional shape or configuration, provided the body portion includes at least one relatively flat surface **11**. The body portion **14** can be formed of a variety of lightweight materials, including plastic, metal, wood or composite materials. In one embodiment, the body portion **14** is formed of polypropylene, such as COROPLAST fluted polypropylene available from Great Pacific Enterprises, Inc. of

Vancouver, Canada. The body portion **14** can be formed in a variety of colors depending on the particular application. For example, in one embodiment the body portion **14** is formed of black polypropylene. In another embodiment, the body portion **14** is formed of white polypropylene. While not intending to be bound by any specific theory or
5 explanation, it is believed that white polypropylene absorbs less heat and ultraviolet light thereby providing the body portion **14** with greater resistance to warping.

The configuration of the body portion **14** can vary depending on the particular application for which the sign **10** is to be used. For purposes of example only and not limitation, the body portion **14** can have a circular configuration, as illustrated in Figures
10 1, 2, 5 and 6, or an elliptical or oval configuration. In other embodiments, as illustrated in Figures 3A-3J, the body portion **14** can be formed in the shape of a polygon, including, but not limited to, a triangle, square, rectangle, rhombus, trapezoid, pentagon, hexagon, heptagon, octagon, nonagon, or decagon. For applications involving sports competitions such as motor vehicle races, the body portion **14** can be configured in the shape of a
15 motor vehicle, such as an automobile or boat, as illustrated in Figures 3K and 3L, respectively. In other embodiments (not shown), the body portion can be configured in the shape of an airplane or motorcycle. For other types of sports competitions, the body portion **14** can be configured in the shape of a piece of equipment associated with the particular sport. For example, as illustrated in Figures 3M, 3N, and 3O, the body portion
20 can be configured in the shape of a football, football helmet, or basketball, respectively. Other types of sporting equipment configurations are also possible, including a baseball, a baseball bat, a baseball glove, a baseball hat, a soccer ball, and others, all of which are considered to be within the scope of the present invention. In another embodiment, the body portion **14** can be configured in the shape of an article associated with a sponsor of
25 an event. For example, as illustrated in Figure 3P, the body portion **14** can be configured in the shape of a bottle where the sponsor of an event is a beverage manufacturer or distributor. In still another embodiment, the body portion **14** comprises a character "X", as illustrated in Figure 3Q, where "X" represents numeric characters and/or alphabetic character that are associated with a particular individual or team.

30 As illustrated in Figures 1, 2, 5 and 6, the sign **10** preferably includes at least one support member **16** attached to the body portion **14**, or formed integrally therewith, for

positioning the body portion at a predetermined elevation. The support member **16** can be formed of a variety of lightweight materials, including plastic, metal, wood, fiber or composite materials. In one embodiment, the support member **16** comprises a metal rod that is inserted into an aperture defined on the edge of the body portion **14** of the sign **10**.

5 For example, as illustrated in Figures 1, 2, 5 and 6, where the body portion **14** comprises a fluted polypropylene, the body portion defines a plurality of apertures along the edge. As illustrated in Figure 4, the support member **16** can include a curved portion **17** that frictionally engages the corresponding aperture in the body portion **14** to prevent the body portion from becoming detached from the support member. In another embodiment
10 (not shown), the support member **16** comprises a wire-like member, such as a metal wire or a thread or string, as is known in the art. According to this embodiment, one end of the support member **16** can be tied to the body portion **14** through an aperture or the like in the body portion and the other end of the support member can be tied to a beam or other support to hang the body portion at the desired elevation. In still another
15 embodiment (not shown), the sign **10** does not include a support member **16**.

The sign **10** includes at least one reflective layer **18** at least partially secured to the body portion **14**. Where the body portion **14** of the sign **10** defines multiple relatively flat surfaces **11**, preferably at least one reflective layer **18** is at least partially secured to each surface. For example, as illustrated in Figures 1, 2, 5 and 6, the body portion **14** has
20 a thickness of less than about .25 inches and defines two symmetrical, relatively flat surfaces **11**. According to this embodiment, preferably a corresponding reflective layer **18** is at least partially secured to each of the two surfaces **11** defined by the body portion **14**. Each reflective layer **18** defines a holographic pattern **19**. According to one embodiment, the reflective layer **18** is preferably formed of a polyester hologram foil that
25 is laminated to the surface of the body portion **14**. A suitable polyester hologram foil is available from Amagic Holographics, Inc. of Irvine, California.

As illustrated in Figures 7A-7E, the holographic pattern **19** defined by the reflective layer **18** can vary depending on the particular application for which the sign **10** is to be used. For purposes of example only and not limitation, the pattern **19** defined by
30 the reflective layer **18** can comprise a plurality of recurring characters "X", as illustrated in Figure 2, where "X" represents numeric characters, alphabetic characters or graphic

designs. In another embodiment, as illustrated in Figures 1 and 7D, the pattern **19** can include a “box” pattern or, as illustrated in Figures 7C and 7E, a “circular” pattern. Other relatively random patterns such as the patterns illustrated in Figures 7A and 7B, as well as a “broken glass” pattern (not shown), can be formed. Other patterns **19** can be formed using circular shapes or polygons, as well as graphic designs and logos, all of which are considered to be within the scope of the present invention. The pattern **19** defined by the reflective layer **18** can also be colored depending on the particular application for which the sign **10** is to be used.

As illustrated in Figures 1 and 2, the sign **10** can also include at least one optically transmissive layer **20** at least partially secured to the reflective layer **18** such that the reflective layer is at least partially positioned between the optically transmissive layer and the body portion **14**. As discussed above, where the body portion **14** of the sign **10** defines multiple relatively flat surfaces each having one or more reflective layers **18** at least partially secured thereto, then at least one optically transmissive layer **20** is at least partially secured to each corresponding reflective layer. The optically transmissive layer **20** defines at least one message **22**. In one embodiment, the message **22** is silk screen printed onto the optically transmissive layer. In other embodiments, the message **22** can be printed on the optically transmissive layer using off-set printing or using flexo-graphic or flexo printing. Using any of this printing methods, a variety of messages and color motifs can be obtained. The optically transmissive layer **20** preferably is formed of a clear polyester or polypropylene, which can be laminated to the corresponding reflective layer(s) **18**.

The message **22** defined by the optically transmissive layer **20** will vary depending on the particular application for which the sign **10** is to be used. For purposes of example only and not limitation, the message **22** defined by the optically transmissive layer **20** is represented by the “X” in Figures 1 and 2, where “X” represents one or more graphic designs, numeric characters, or alphabetic characters. In another embodiment, as illustrated in Figure 1, the optically transmissive layer **20** may also define an interior portion **24**, a border **26** encompassing the interior portion, and at least one message **22** positioned at least partially within the interior portion. The message **22**, or portions thereof, can be positioned entirely within the interior portion **24** or in both the interior

portion and border **26**. Other messages **22** can be positioned solely within the border **26**. The interior portion **24** and the border **26** preferably comprise contrasting colors. In one preferred embodiment, the border **26** is a symmetric circle or square that directs and focuses, in combination with the light being reflected by the corresponding reflective layer **18**, a viewer's attention to the message within the interior portion **24**.

According to the embodiments illustrated in Figures 1 and 2, each corresponding reflective layer **18** is structured to receive light through the optically transmissive layer **20** and deflect the light back through the optically transmissive layer in the holographic pattern **19** defined by the reflective layer. More specifically, where the reflective layer **18** defines a pattern **19** of recurring holographic characters, the reflective layer is structured to reflect light through the corresponding optically transmissive layer(s) **20** to thereby visibly display the plurality of holographic characters defined by the reflective layer and to enhance the visibility of the message **22** defined by the optically transmissive layer. In an embodiment in which the optically transmissive layer **20** defines an interior portion **24** and a border **26**, the reflective layer **18** is structured to reflect light through the optically transmissive layer to augment the contrast between the interior portion and the border to thereby enhance the visibility of the message positioned within the interior portion.

In other embodiments of the invention, as illustrated in Figures 5 and 6, the reflective layer **18** defines at least one message **22** thereby eliminating the necessity of the optically transmissive layer. As discussed above, the message **22** can be silk screen printed onto the reflective layer **18**. In other embodiments, the message **22** can be printed on the reflective layer **18** using off-set printing or using flex-o-graphic or flexo printing. The message **22** defined by the reflective layer **18** will vary depending on the particular application for which the sign **10** is to be used. As discussed above, the message **22** defined by the reflective layer **18** is represented by the "X" in Figures 5 and 6, where "X" represents one or more graphic designs, numeric characters, or alphabetic characters. In another embodiment, as illustrated in Figure 5, the reflective layer **18** may also define an interior portion **24**, a border **26** encompassing the interior portion, and at least one message **22** positioned at least partially within the interior portion. The message **22**, or portions thereof, can be positioned entirely within the interior portion **24** or in both the interior portion and border **26**. Other messages **22** can be positioned solely within the

border 26. The interior portion 24 and the border 26 preferably comprise contrasting colors. In one preferred embodiment, the border 26 is a symmetric circle or square that directs and focuses, in combination with the light being reflected by the corresponding reflective layer 18, a viewer's attention to the message within the interior portion 24.

5 According to the embodiments illustrated in Figures 5 and 6, each corresponding reflective layer 18 is structured to deflect light in the holographic pattern 19 defined by the reflective layer. More specifically, where the reflective layer 18 defines a pattern 19 of recurring holographic characters, the reflective layer is structured to reflect light to thereby visibly display the plurality of holographic characters defined by the reflective
10 layer and to enhance the visibility of the message 22 defined by reflective layer. In an embodiment in which the reflective layer 18 defines an interior portion 24 and a border 26, the reflective layer 18 is structured to reflect light to augment the contrast between the interior portion and the border to thereby enhance the visibility of the message positioned within the interior portion.

15 Thus, the present invention provides an improved sign having high visibility. The sign is inexpensive to manufacture, allows for the permanent placement of a desired message, is capable of supporting variations in color motifs and is easily recognizable in relatively dim lighting conditions and when used with other competing signs. Many modifications and other embodiments of the invention will come to mind to one skilled in
20 the art to which this invention pertains having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic
25 and descriptive sense only and not for purposes of limitation.